UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,614	02/25/2002	James W. Klett	0941.0	4463

24298 7590 06/09/2003

UT-Battelle, LLC
111 Union Valley Rd.
PO Box 2008, Mail Stop 6498
Oak Ridge, TN 37831

EXAMINER	
CHANG, VICTOR S	

ART UNIT	PAPER NUMBER
1771	3

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,614	KLETT ET AL.	
	Examiner	Art Unit	
	Victor S Chang	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) 9-22 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-8, drawn to an article for passively converting energy from one form to another, classified in class 428, subclass 71.

II. Claims 9-22, drawn to a process for preparing a passive energy-converting composite article, classified in class 156, subclass 78.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case process as claimed can be used to make other and materially different product, such as a carbon foam heat sink with phase change material.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Kirk Wilson on 6/4/2003 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-8. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 9-22 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6, line 2, the phrase "one direction along said working surface" is vague and indefinite, the Examiner suggests to change "along" to --perpendicular to--.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauf et al. (US 5786666) in view of Klett et al. (US 6037032).

Lauf's invention is directed to a microwave tube with an improved collector surface coating comprises a porous carbon-bonded carbon fiber composite (Abstract). Lauf teaches that an object of the invention is to provide means for better heat transfer characteristics between the low-emission surface and the collector body (column 2, lines 1-4). Preferably, the low electron emission material is a low-density carbon-bonded carbon-fiber (CBCF) composite, the electron collector material is copper, and the two are bonded by vacuum brazing (column 2, lines 54-57).

For claims 1 and 2, Lauf lacks an express teaching of a carbon foam as a thermally conductive path. However, it is noted that Kleff's invention is directed to a carbon foam heat sink (Abstract), Kleff also teaches that it is known that graphitized carbon foam is inherently highly thermally conductive, as evidenced in 2:40-41 of US-6037032, which is an allowed patent of incorporated U.S. Application 08/921,875 (column 1, lines 7-8). Further, in Example 7, Kleff teaches that a carbon-carbon material can be coated onto a carbon foam, then graphitized to form a foam with a carbon-carbon facesheet bonded to the surface (column 9, lines 5-20). As such, it would have been obvious to one of ordinary skill in the art to modify and form Lauf's CBCF surface coating on a graphitized carbon foam as taught by Kleff, motivated by the desire to improve the heat transfer property to the CBCF coating.

For claim 3, it is known art that for forming a CBCF coating, the carbon fibers used are generally not more than about 20 μm in diameter, not more than about 1 mm

in length, as evidenced by the state of the art of Lauf et al. (US 5243464, at column 3, lines 49-52).

For claim 4, Kleff teaches that the pore sizes of his carbon foam are in the range of 90-200 microns (column 7, lines 41-42).

For claims 5-6, although Kleff does not expressly teach the depth of the CBCF coating into the carbon foam and the thickness of the coating, these parameters are believed either inherently disclosed by Kleff, or an obvious modification to one skilled in the art, motivated by the desire to form a strong bond between the coating and the foam, and to provide sufficient function (e.g., secondary electron absorption) to the CBCF coating.

For claim 7, it is known art that CBCF coating can be used as a microwave load and formed with a thickness variation to function as a tapered impedance element, as evidenced by the state of the art of Lauf et al. (US 5742211, Abstract).

For claim 8, Kleff teaches that other possible embodiments may include materials, such as metals, etc., bonded to the surface of the foam to produce a foam core composite material (column 9, lines 39-41), which inherently encompasses metals such as Cu, Al, etc.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 703-605-4296. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 703-308-2414. The fax phone numbers

for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

VSC
June 5, 2003

DANIEL ZIRKER
PRIMARY EXAMINER
GROUP ~~1300~~ 1700

Daniel Zirker